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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Care of Park Trees . . . 151
A Garden for Children . . . 151
Notes on the Pine Forests of Southern and Central Arizona, *Professor J. W. Toumey.* 152
FOREIGN CORRESPONDENCE:—London Letter . . . *W. Watson.* 153
ENTOMOLOGICAL:—An Enemy of Narcissus and Amaryllis. (With figure.) *J. G. Jack.* 154
CULTURAL DEPARTMENT:—Seasonable Notes . . . *W. N. Craig.* 156
Some Cool-house Shrubs . . . *W. H. Taplin.* 156
Erythronium grandiflorum and Related Species . . . *Carl Purdy.* 157
Lilium Harrisii and the Electric Light . . . *S.* 157
Sternbergia Fischeriana . . . *J. N. G.* 157
Carnations, Calla Elliottiana . . . *T. D. Hatfield.* 158
CORRESPONDENCE:—Notes from Cornell University . . . *A. B. C.* 158
An Orchid Scale, Aspidiotus biformis . . . *Professor T. D. A. Cockerell.* 158
Plants at Wellesley . . . *T. D. Hatfield.* 158
Notes from Germantown . . . *Joseph Meehan.* 159
RECENT PUBLICATIONS . . . 159
NOTES . . . 160
ILLUSTRATION:—Merodon equestris, a Narcissus pest, Fig. 18 . . . 155

The Care of Park Trees.

WANT of technical knowledge makes it easy, apparently, to discuss in print the complex and often difficult conditions which affect trees in urban parks, and makes their critics peculiarly eager to blame park managers when they attempt to improve park plantations by necessary thinnings. Ill-advised protests against cutting trees menace the beauty and usefulness of every American park, and in some of our cities this has been carried to such a point that park commissioners and superintendents are so intimidated that the plantations under their charge are abandoned to their fate, or, if a tree has to be cut down, it is done surreptitiously. We have over and over again called attention in these columns to the importance of judiciously thinning park plantations, taking the side of experts against theorists, and maintaining that if the greatest possible enjoyment is to be obtained from public parks they must be managed by men who understand their business.

This subject has recently been attracting a good deal of attention in Boston, where correspondents of the daily papers, usually signing themselves "artist," have been vigorously protesting against the much-needed thinnings which have been made this year in the park plantations. Boston a few months ago was fortunate in securing the services of an educated, well-trained and efficient Park Superintendent, who has become the executive of the Board of Park Commissioners. The new Superintendent saw at once that the park plantations placed in his charge were in a deplorable condition. The trees, as we pointed out in these columns a few months ago, were overcrowded, full of dead wood, improperly nourished and suffering from the attacks of various insects. Nothing had ever been done to these woods and groves since the city purchased them several years ago, and they have been in an unsatisfactory and dangerous condition. The first thing to be done, of course, under such circumstances is to remove dead and dying trees, to cut out unnecessary saplings, which often spring up like weeds in neglected parks and plantations, and to furnish room and admit light to the more promising trees. This the new Superintendent proceeded gradually to do, and it is this attempt to improve the Boston parks which has raised such a storm of protest from persons who, forgetting that parks are not primeval forest, declare that the natural beauty of the Boston park woods and plantations is being destroyed. Such critics never remember that provision must be made in parks for the free enjoyment and circulation of great crowds of people, and that in order to afford such facilities for the public natural forest conditions must be more or less sacrificed. Few people realize that the sylvan charms they plead for can only be secured with the aid of healthy trees, and that trees which are overcrowded, half-dead and full of insects can never produce the results they demand. Segregations of human beings in cities and their suburbs so change natural conditions that woods in urban parks cannot be left exclusively to the care of nature, however attractive this may sound in the mouths of enthusiasts; and man must adapt his plantations to the unnatural conditions he has provided for them.

This whole subject is of such vital importance in its relation to the artistic and practical value of American parks that we have taken occasion to examine carefully the effects of the tree-cutting which has been done in the Boston parks during the past winter, and our criticism upon it is that the new Superintendent, desiring probably to feel his way in a community new to him and unfamiliar with local conditions, has nowhere yet sufficiently thinned the plantations in his charge, and that the Boston parks, like those in every other American city with which we are acquainted, are still suffering from insufficient tree-cutting.

A Garden for Children.

WE have already called attention to a series of leaflets prepared for the teachers of rural schools in the state of New York, under the direction of Professor Roberts, Director of the Ithaca Experiment Station. Under a state law enacted for the purpose of extending the work of the experiment station so as to give an impulse specifically educational to the farmers of the state, several plans are under trial. Itinerant or local experiments have been used as a direct means of teaching. Bulletins have been issued on various subjects like apple-culture, etc., in which the theory and practice is briefly explained, and the history and condition of different branches of rural industry have been written in an attractive way. Horticultural institutes or schools have been held in different towns and cities of the state, and courses of reading have been prescribed in connection with correspondence with the teachers in the Agricultural College. One of the latest efforts is an attempt to establish the study of nature in rural schools, and it is to encourage this that the leaflets of which we have spoken have been prepared. These little bulletins were primarily intended for the teacher, and were meant to suggest the ways in which he can interest his pupils at odd times in some natural object or process. Of course, they may be given directly to the advanced pupils for the purpose of suggesting to them experiments and observations and for encouraging them to examine objects for themselves to form conclusions of their own and to state them in their own language. Four of these illustrated leaflets have been published, in the first of which the pupils are asked to investigate the way in which a Squash-plant gets out of its seed; in the second, a burning candle is the object of study, and in the third they are asked to examine an apple-twig and trace the history of its fruit-spurs, its flower-buds, its leaf-buds, its branchlets, etc. This third leaflet will be found full of interest and suggestion to many grown-up children who call themselves educated. A fourth leaflet is for pupils rather than teachers, and it requests every school child in the state to grow a few plants during next summer. The only way to learn how plants grow is to grow them, and personal investigation is the only way, as the leaflet suggests, in which one can become intelligently interested in anything that lives and grows. The specific request is

that the children shall grow two kinds of flowers, Sweet Peas and China Asters, because the seeds of each are cheap, they are easy to grow, they are handsome and both come in various colors. There are brief instructions about selecting the ground, making the bed, how and when to plant the seed, the varieties to select, and how to care for and water them. In all cases the reasons for a given treatment are suggested. Inasmuch as the experiment station has had a bulletin on each of these plants any one who wants to have more specific knowledge of them is invited to send to the Cornell Experiment Station for these bulletins.

Now, it is not wise to expect too much from any scheme like this. No doubt, there are hundreds of children who will plant the seeds and whose enthusiasm will then die out and they will be left as ignorant as they were before; but any child whose attention has been aroused by his parent or teacher in the manner suggested by the earlier leaflets of this series has his face set in the right direction for the formation of the habit of looking properly at things and drawing correct conclusions from what he sees. If in addition to this the child is asked to write out his observations and conclusions, and to make sketches of his plants at different stages of their growth, he has begun the study of nature in a way that will not only help his intellectual development, but will prove a source of comfort and pleasure to him all his life long. We assume that any child in New York state can have one of these leaflets if he chooses. Perhaps, by a stretch of generosity, the director of the station might send them to places outside of the state. This subject is one of great interest and we shall recur to it again. Meanwhile, we hope that any reader of Garden and Forest who can do so will persuade some boy or girl to try a little garden of these two plants, for there is an advantage in limiting the study to a few kinds only. A place four feet wide and twenty feet long is as large as most boys or girls will take care of. Half of the ground should be devoted to the Peas, the other half to the China Asters, and four or five distinct kinds in different colors will make enough variety. The leaflets, which can probably be had by addressing the Chief Clerk of the College of Agriculture at Ithaca, New York, give a few necessary directions at the outset, and some suggestions as to the proper line of study will be made later on.

Notes on the Pine Forests of Southern and Central Arizona.

MUCH of the forest area of Arizona is in the northern portion of the territory on the Colorado plateau, and our Pine forests reach their highest development in the vicinity of the San Francisco Mountains. From here they stretch northward to and beyond the Grand Cañon of the Colorado River, westward to Bill Williams Mountain, and southward to the rim where the Colorado plateau breaks down to the southern plains. This is what is generally known as the coniferous forest area of Arizona. In addition to this, Arizona has considerable timber in the south and central portions of the territory. The many mountain ranges south of the Colorado plateau, reaching an elevation of 7,000 feet, have more or less extended areas of cone-bearing trees. It is of these forests that I desire to speak.

The Bradshaw Mountains, Mogollon Mountains, Mazatzal Mountains and the White Mountains may be considered as southern extensions of the Colorado plateau. Of these mountains the Bradshaw Mountains are the most poorly supplied with Pine timber. The forest area of this range of mountains is mostly in the vicinity of Prescott, extending from here about twenty or twenty-five miles south and south-westward. The Mogollon Mountains and the Mazatzal Mountains are separated from the Bradshaw Mountains by the Verde Valley. Both of these ranges have wide strips of Pine along their summits. The White Mountains are well timbered with White and Yellow Pine, some of the most valuable Pine in the territory being on these mountains.

Immediately south of these are a number of lower ranges, namely, the Pinal, Superstition, Caliuro and the Gila Mountains. All of these ranges have a narrow fringe of Pine along their summits, varying from a few yards to a half mile in width, and in places extending for some distance down the cañons.

In the south and south-eastern portions of the territory, south of the ranges mentioned, are a number of others with summits reaching to, or nearly to, the height of 10,000 feet. All of these mountains are well timbered above the altitude of 7,000 feet. Enumerating these ranges in their order, beginning in the very south-eastern part of the territory, we have the Chiricahua, the Huachuca, the Santa Rita, the Rincon and the Santa Catalina Mountains. The entire western and south-western portions of the territory have no high mountains and are therefore entirely destitute of cone-bearing trees. Between the high southern ranges are a number of lower ranges, namely, the Whetstone, the Dragoon, the Mule, the Tucson and the Pinaleno Mountains. These ranges are all destitute of Pine, or have very restricted areas of Nut Pines on their higher slopes.

Confining our attention to the area of Pine in Arizona south of the Colorado plateau, and not taking into consideration our three species of Nut Pine, I should place the areas in square miles as follows: The Bradshaw Mountains have about twenty-five square miles that might properly be termed forest. The forest area of these mountains is nowhere very dense and consists of narrow, broken stretches of Yellow Pine, Pinus ponderosa scopulorum, along the highest portions of the range. Below the area of Yellow Pine, at an elevation of about 6,000 feet, is a large belt of Nut Pine, P. monophylla, while farther down the mountains are thousands of acres covered with a scattered growth of the small Nut Pine, P. edulis.

The forest area of the Mazatzal Mountains may be placed at about seventy square miles. A dense strip of Yellow Pine extends southward from Baker's butte into this range of mountains. Growing with the Yellow Pine at the higher elevations are scattered specimens of White Pine, Pinus flexilis; Fir, Abies concolor: Douglas Spruce, Pseudotsuga taxifolia; while at lower elevations are large areas of Junipers and the two Nut Pines (Pinus edulis and P. monophylla). The Foxtail Pine, P. Balfouriana, var. aristata, does not seem to reach south of the San Francisco Mountains.

The Mogollon Mountains have some forty square miles of timber. This area is a continuation of the forests of the Colorado plateau and is very similar to the forests of the Mazatzal range.

The White Mountains are known to be well timbered, but I am unable to state the area of Pine forests upon them. Taking into consideration their area above 7,000 feet and the various species of Pine collected there, it is safe to estimate that at least a hundred square miles of these mountains are more or less thickly timbered with Pine. On the higher portions of this range are considerable areas of White Pine, Pinus flexilis, mixed with Fir and Spruce. Many of the cañons are lined with an excellent growth of Cypress, Cupressus Arizonica. This tree is also found in the mountain ranges to the west. At the Natural Bridge it forms large forests almost to the exclusion of other trees.

The low mountains south of these four ranges, namely, the Pinal, the Superstition, the Galluro and the Gila ranges, altogether have not more than thirty-five square miles of what might properly be termed forest area. This area is almost entirely of Yellow Pine, and is represented by narrow fringes along the summits of the mountains and at the upper courses of the cañons. Much of these mountains, however, is covered with a scattered growth of Nut Pines, Pinus edulis and P. cembroides. In these low mountains the two species of Nut Pine above mentioned come together, one being a northern species and the other a southern. Below the Pines all these mountains of central Arizona are thickly covered with a dense growth of Scrub Oak, Quercus undulata.

The distribution of the Pine forests on the high mountains

of south and south-eastern Arizona is very interesting on account of the number of species represented and the varying preponderance of species on the different ranges. The forest area of the Chiricahua Mountains is about 150 square miles. This area extends almost continuously from the Mexican line to Apache Pass, a distance of about forty miles. I think it safe to estimate the average width of this forest belt to be nearly four miles. The Yellow Pine of the more northern mountains here gives place almost entirely to a form having longer and broader leaves. This Yellow Pine is the prevailing tree of the Chiricahua Mountains. The Arizona Pine, Pinus Arizonica, is abundant in many of the cañons, but nowhere forms a preponderance of the forest growth. The Chihuahua Pine, P. Chihuahuana, a tree entirely unknown north of the Santa Catalina Mountains, is frequent at intermediate elevations between the Nut Pine, P. cembroides, and the Yellow Pines. On these mountains two species of White Pine come together, one, P. flexilis, being a northern species, while the other, P. strobiformis, is a southern species. The White Pines occur as scattered specimens or in groups of a dozen or more trees at the heads of the cañons and along the summit of the range. On no part of the mountains do they add materially to the forest growth. It is worthy of note that a number of groves of Arizona Cypress occur in the cañons on the western slope of this range.

The estimated forest area of the Huachuca Mountains is about thirty square miles. This is an irregular, broken area covering the slopes of the higher peaks and extending in places some distance down the cañons. Nowhere are the forests of these mountains as dense or valuable as those of the Chiricahua Mountains. A few restricted areas on the northern slopes are, however, fairly well timbered with the different species of Yellow Pine, namely, Yellow Pine, Southern Yellow Pine and the Arizona Pine. A scattered growth of Chihuahua Pine is found on these mountains just below the Yellow Pines. A few scattered trees of White Pine, Pinus flexilis, are found in the higher cañons. But one species of Nut Pine, P. cembroides, is found in this range.

The Santa Rita Mountains have a forest area of about thirty-five or forty square miles, centering about the high peak known as Baldy. These forests are of a denser growth than those of the Huachuca Mountains, but the same species are common to the two ranges, and in the same relative proportions. In relation to forest growth these two ranges are more alike than any of the ranges of southern Arizona.

Probably twenty-five square miles would represent the entire forest area of the Rincon Mountains. The forests here are unusually uniform, and consist almost entirely of the Arizona Pine, Pinus Arizonica. It is interesting to note that the Yellow Pine, P. ponderosa, the prevailing tree on all the other ranges of southern Arizona, rarely occurs on these mountains. The Nut Pine, P. cembroides, is abundant, and the Chihuahua Pine is not infrequent.

The Santa Catalina Mountains are very broken and irregular, the highest point, Mount Lemon, reaching the altitude of 10,100 feet. The area of timber on this range is in the neighborhood of fifty square miles. All the higher portions are more or less thickly covered with Pine, Fir and Spruce. On the northern slope of Mount Lemon are growing the largest specimens of Douglas Spruce I have observed in the territory. At this locality, in a number of places, this species is the prevailing tree, many of the specimens being from five to six feet in diameter. Yellow Pine, Pinus ponderosa scopulorum, is the prevailing Pine. In these irregular, broken mountains are found all the species of Pines known to occur in the mountains of southern Arizona, with the possible exception of the southern White Pine, P. strobiformis.

The forest area of Arizona south of the Colorado plateau is, in round numbers, about 600 square miles. The total area of Arizona south of this plateau is about 75,000 square miles. From this it would appear that the Pine forest area of southern Arizona is considerably less than one per cent. of the entire area. If we include the forests of Mesquite and other deciduous trees along the watercourses and in the lower parts of the cañons the total forest area would, of course, be slightly larger.

University of Arizona, Tucson. *J. W. Toumey.*

Foreign Correspondence.

London Letter.

Phajus Cooksoni.—This is generally accepted as one of the most valuable plants that we owe to the skill of the hybridist, but its merits were never so fully revealed as by the specimen exhibited last week by the raiser, Mr. N. Cookson, of Wylam, Northumberland; this was a large mass carrying numerous large, healthy leaves and eighteen strong erect spikes a yard high, each supporting numerous rose and brown-purple flowers. I find this plant becomes unhealthy if kept in a tropical temperature, whereas in the intermediate house it is quite happy.

Odontoglossum crispum Luciani.—A first-class certificate was awarded to a beautiful variety shown under this name by Monsieur Linden, Brussels; the flowers were nearly four inches across, broad in the segments, white, shaded with rose and heavily blotched with purple-brown. The plant shown was small and bore only one small spike; there is, therefore, every prospect of its proving a still more valuable acquisition when cultivation has put some strength into its pseudo-bulbs and spikes. Connoisseurs voted it of first quality.

Epicattleya matutina.—This is a new hybrid obtained by Messrs. J. Veitch & Sons from Epidendrum radicans crossed with Cattleya Bowringiana, the latter being the mother parent. The stems and general character of the hybrid are much more like those of the Epidendrum than the Cattleya, and the flowers, which are about two inches across, are yellow, tinged with vermilion, while in the three-lobed red and yellow labellum there is still less evidence of the Cattleya's influence. Those who hold that prepotency is on the side of the female have strong evidence to the contrary in this hybrid.

Cirrhopetalum robustum is now flowering for the first time at Kew. It is a remarkable species, its leaves and flowers being much larger than those of any other species known, the former being about twelve inches by four inches and the latter four inches long, the width of the segments being correspondingly large; they are borne in umbellate clusters seven inches through, and they are yellowish green with a dark red oscillating lip. The species was first described by Mr. Rolfe in 1893 from a plant introduced from New Guinea. C. graveolens, Bailey, is a synonym.

An Orchid Society.—It is reported that Manchester Orchid fanciers are about to form a society in the interests of their cult and entirely independent of any other society. "An entrance fee of three guineas and an annual subscription of one guinea thereafter is suggested, but this and other matters are subject to approval of the meeting to be called at an early date. It is estimated that within a radius of thirty miles of Manchester the Orchid wealth of the country is centralized." If this society will limit its operations to such matters as the spread of a taste for Orchids, their cultural requirements, etc., nothing but good can come of it, but if it enters into rivalry with the Royal Horticultural Society and Kew with regard to nomenclature and certificates, it may prove more vexatious than useful.

Lathyrus splendens.—In Garden and Forest, 1894, p. 274, I asked for more information about this Californian Pea, the "Pride of California." According to Mr. Orcutt, and on p. 294, I was told that it had not proved hardy in the northern states. Nor has it proved hardy or ever shown anything like comfort out-of-doors here, but about two years ago I planted a seedling in a bed of sandy soil in a low, airy greenhouse, and this has proved quite a success. It has thrown out hundreds of shoots with healthy pinnate leaves, and from all the strongest of them numbers of

flower-scapes are now developing. The first two racemes opened about a week ago and gave us a foretaste of what we are to expect about the middle of April. What a lovely plant it is! flowers like those of the Sweet Pea, but of the richest carmine-crimson which glows in sunshine. This is a first-rate plant for the greenhouse here; it is perennial, stands London fog and yields a large crop of richly colored flowers in early spring. A figure drawn from the Kew plant has been prepared for *The Botanical Magazine*.

Hibiscus mutabilis.—The double-flowered variety of this Hibiscus is a worthy garden plant, which, however, is rarely seen in cultivation—in European gardens, at any rate. Mr. Cannell sent me some flowers of it a few days ago, describing it as a new Mallow, and by far the finest he had ever seen; they were three inches across, very double, and colored bright rose, flaked with white. Originally Chinese, the type has long been cultivated or become established in most parts of the tropics. The double-flowered form was first flowered in London about a hundred years ago, plants having been raised from seeds obtained from Jamaica, where it forms a tree fifteen to twenty feet high, with palmately lobed, green, hairy leaves four to six inches across; the flowers are borne singly on axillary peduncles, and they are white when first they open, changing to pink, and finally to deep red. There is a good figure of this double variety in Andrews' *Botanical Repository*, t. 228.

Narcissus, Ellen Willmot.—This is a new variety or cross of the Ajax section which we owe to the skill of the Rev. G. H. Engleheart, of Andover, one of the most successful breeders of Daffodils. It has the form of Madame de Graaf or Empress, but is larger, and is remarkable for the width and shortness of its trumpet and its broad overlapping sepals and petals. The color of the trumpet is lemon-yellow, while the other parts are creamy white.

Narcissus, Southern Star, is another new seedling from the same source. It is one of the Poeticus section, but the flowers are about four inches across, with broad overlapping segments of the purest white, and the shallow, spreading, eye-like cup is nearly an inch across, and colored bright orange-red, becoming paler toward the base.

Tulipa Kaufmanniana.—A first-class certificate was awarded to this plant last week, when it was shown in fine condition by Messrs. P. Barr & Sons, Covent Garden, and Messrs. Wallace, Colchester. It has a short stem, broad leaves and large erect flowers, the segments of which are oblong-obovate, forming a deep cup, their color yellow at the base, the upper portion white, suffused with rose-purple. It is reported that this species is being naturalized in the garden of Mr. L. de Rothschild at Leighton Buzzard, where it does well in the grass, and was in flower on March 23d. According to a correspondent in *The Gardeners' Chronicle*, it flowered outside in a garden in Salisbury on February 26th. For its introduction we are indebted to Mr. A. Regel, who found it in Turkestan some years ago. It appears to vary in the form and color of its flower-segments and also in its leaves, judging by the figure in Regel's *Gartenflora* and the plants shown by Messrs. Barr and Wallace. It belongs to Baker's Eriobulbœ, which has woolly outer bulb-coats and broad leaves. There is a hybrid between it and Tulipa Greigii, received by Herr Max Leichtlin a year or two ago.

London. *W. Watson.*

A bulb is simply a large bud with close-packed, fleshy leaves or leaf-bases in which is stored an accumulation of starch, sugar and other concentrated plant food. As hibernating animals store up fatty matter before going to sleep for the winter so do bulbs store up surplus food and hide themselves under ground so as to go through cold and drought unharmed. Bulbous plants are developed in regions where there are sudden changes of temperature or of drought and moisture, and the great natural bulb fields of the world are found where it is very cold or very dry in winter, rainy and warm in spring, and blazing hot and dry in summer and autumn.—*F. W. Burbidge, M. A.*

Entomological.

An Enemy of Narcissus and Amaryllis.

In Merodon equestris, the Narcissus Fly, we have one more addition to the numerous insects which have been introduced from the Old to the New World. Its first advent in the United States appears to have been many years ago, for Packard, in his *Guide to the Study of Insects*, published in 1869, states that the late F. G. Sanborn bred the flies from larvæ which were probably introduced by importers of Dutch bulbs. Since that time the pest does not seem to have become common in this country, at least it appears to have been rarely, if ever, noticed by economic entomologists, although gardeners may have had more experience with it than is generally known.

In the Agassiz Museum, at Cambridge, Massachusetts, there are larvæ of this pest and damaged bulbs of Narcissus which were received from a garden in Brookline, Massachusetts, in 1879. During the past year or two this same establishment has suffered more than usual damage from the ravages of the Merodon, which appears to have been present in more or less abundance every season since it was first noticed in the place nearly twenty years ago. At that time, besides various species and varieties of Narcissus, it was found to attack bulbs of Vallota purpurea and its varieties. Recently it has been found very destructive to many rare and beautiful Hippeastrum hybrids, formerly known under the generic name of Amaryllis, and it is probable that it will be found to attack other plants of the Amaryllis family, to which the Narcissus belongs. There does not appear to be any previous record that it has ever attacked anything except Narcissus. The pest has affected bulbs, both in the open air and in the greenhouse.

The damage is caused by stout brownish maggots which live within and devour the interior of the bulb, either entirely destroying its vitality or so weakening it that it fails to flower or gradually decays. These maggots when full grown vary in length from about half an inch or a little more when the body is in repose to about three-fourths of an inch when active and extended. The body is somewhat wrinkled, composed of eleven or twelve distinguishable segments, upon which are a few very minute hairs. The head is very small and armed with a blackish two-pronged hook used in scraping the bulb, and on the posterior or anal segment there is a conspicuous hard, shining, black double-tubed organ, and a little below each side of this is a short horn-like appendage. When fully grown the maggots usually leave the bulbs and enter the surrounding earth near its surface, or rarely remain in the remnants of the bulbs, and change to stout dark brown inert pupæ, about half an inch in length and retain some of the marks characteristic of the larvæ. From these pupæ flies emerge in the spring if the bulbs are out-of-doors, or during the winter if they are grown under glass. These flies are two-winged and bear considerable resemblance to the well-known bot-flies, or to the Chrysanthemum flies, Eristalis tenax, familiar on flowers in late summer and autumn. They might be mistaken for very small humble-bees, except for the fact that the latter have four wings, while the Narcissus fly has only two. These wings spread an inch or more from tip to tip and may be nearly clear or slightly smoky.

The body averages over half an inch in length and is sometimes nearly three-fourths of an inch long. The body-color is usually bluish-black, more or less densely covered with broad areas or bands of orange, yellow, brownish or blackish hairs. The color and proportions of these areas of colored hairs are so variable as to have caused the early entomologists to give Merodon equestris several other specific names, but it would not be profitable to consider these variations here. Most commonly the male has the fore part of the top of the thorax thickly covered with yellow-brown hair, a broad black band or saddle across the middle above the insertion of the wings, the posterior tip of the thorax and first two segments of the abdomen

covered with tawny colored hairs, and the remaining part of the abdomen with bright yellow-brown hair. A common type among the females has the thorax covered with bright ferruginous hairs, the fore and hinder parts of the abdomen covered with paler hair and with a black band across the middle portion. As in most flies, the eyes are very large, appearing to form the principal part of the head. They are black, and sparingly covered with microscopic brown hairs. In the males the eyes are near together, touching at one part; in the females they are well separated by a brown hair-covered ridge which broadens from the top toward the mouth parts. The legs are black or dark brown and more or less covered with black or gray or

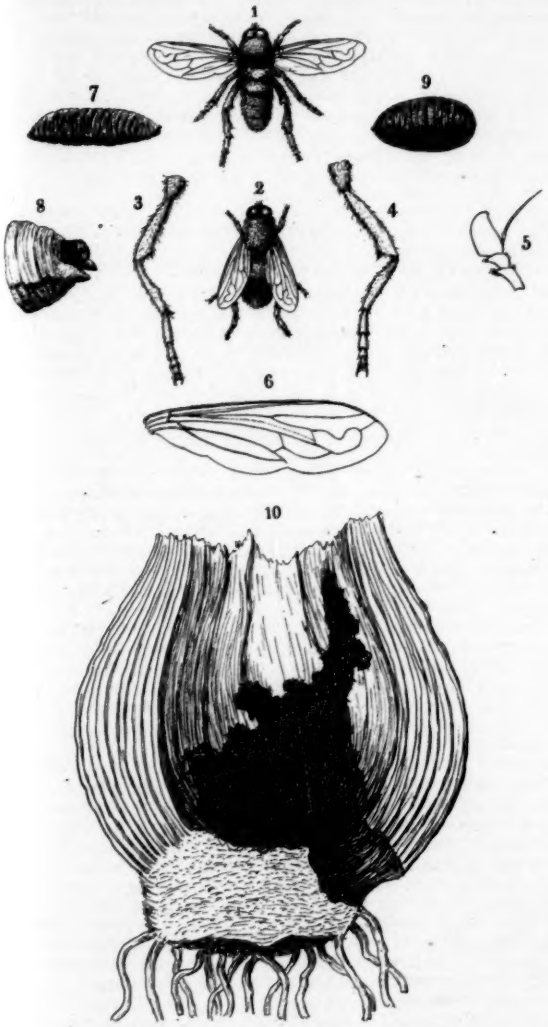

Fig. 18.—Merodon equestris, a Narcissus pest.—See page 154.

1. Male fly, natural size. 2. Female fly, natural size. 3. Posterior leg of male, enlarged. 4. Posterior leg of female, enlarged. 5. Antenna, enlarged. 6. Wing, enlarged. 7. Larva, natural size. 8. Anal segments of larva, enlarged. 9. Pupa, natural size. 10. Section of Amaryllis bulb, showing destructive work of larva and hole made for exit.

tawny-colored hair. The generic name of Merodon was given on account of a small tooth-like projection on the lower end of the femur of the posterior leg.

So far as known only one or two eggs are deposited at each plant, and the female appears to deposit them near the base of the leaves above ground in May or June, when the plants are out-of-doors. Upon hatching, the young larva is said to work its way into the bulb by burrowing between the scales, and once in its heart, it makes a large cavity from which it only emerges when fully grown. Usually only one larva occurs in each bulb, but more may sometimes be found. It is not easy to detect infested bulbs until the maggots are nearly fully grown and the bulbs soften because of the ravages in the interior. Sometimes the entrance of the maggot may be detected by a minute brown streak showing where it entered between the scales at the top of the bulb.

Apparently, the first account of the Narcissus Fly is that given and figured by Réaumur in the fourth volume of his celebrated *Mémoires*, published in 1738. He there states that in November, several years previously, Bernard de Jussieu had given him a number of bulbs of Narcissus in which he found the larvæ, and from which he bred the flies. In 1792 Fabricius described it as Syrphus equestris, afterward placing it in the genus Merodon. On account of the variability of the insect it has received a number of synonyms, among which appear to be Merodon flavicans, M. cinereus, M. Narcissi, M. ferrugineus, M. transversalis, M. constans, M. nobilis, M. tuberculatus and M. bulborum.

The bulb growers of Holland have long known Merodon equestris as a serious foe to Narcissus-culture, and we have records of its presence in that country since before 1840. It is generally considered as having been introduced into Holland with bulbs from southern Europe, probably from Italy. Various accounts of its ravages appeared from time to time, and it was a frequent topic of discussion in meetings of Dutch bulb growers, who found it difficult to combat on account of its habits and little-known life-history. In *The Gardeners' Chronicle* for 1842 there is a figure and account of the insect by the late John Curtis, who wrote under the nom de plume of Ruricola, and this figure was reproduced in the same journal in 1877 and 1885. The same figure is given in Burbidge & Baker's monograph of the Narcissus, published in 1875. Among other important papers was one published by F. W. van Eeden, of Haarlem, in 1853, and one by A. C. Groenewegen, of Haarlem, in 1883. The latter advised watching for weak plants and those that failed to grow in spring, and their destruction if infested, and the searching for the chrysalids which might be found near the surface of the ground around the plants before they flowered.

In May, 1882, Mr. J. H. Krelage, the well-known bulb grower of Haarlem, sent specimens to Dr. J. Ritzema Bos, with the request to make a complete study of the pest, the results to be published at the expense of the association of bulb growers of which Mr. Krelage was president. The outcome was an elaborate paper, with two plates of figures, entitled "La Mouche du Narcisse," published in *Archives du Musée Teyler*, series 2, vol. ii., part 2, Haarlem, 1885, and published also in the Dutch language. In this exhaustive monograph the author gives the results of various experiments in attempts to find means to combat this insect. One, at first thought to be efficacious, was very simple, and consisted of the immersion of the bulbs in water for eight days before planting, this seeming to kill or drive out the larvæ. Further experiments, however, showed him that immersion could not be relied upon to kill the maggots, and this conclusion is verified by Mr. Krelage in the *Revue Horticole* for 1889, who states that the method most generally followed with success is Groenewegen's plan already referred to. If the spring is cold and wet when the flies are emerging from pupæ a large proportion of them may die without laying eggs, and so there are periods of comparative immunity, but after a few favorable seasons they again become abundant.

In Brookline, Narcissus-bulbs in a warm dry rockery have been found much more liable to destruction than those growing in low damp ground, and especially among grass. Also, Hippeastrums under warm dry cultivation have been found much more affected by the pest than those grown under cool and moist conditions. Among these beautiful and often high-priced flowers the Merodon

equestris has proved itself capable of doing much damage, and cultivators should be on their guard against it.

The figures of Merodon equestris, on page 155, are from drawings by Mr. C. E. Faxon.

Jamaica Plain, Mass. *J. G. Jack.*

Cultural Department.

Seasonable Notes.

AT this season every inch of available greenhouse bench and shelf room is in use, and it is difficult to find space for all the plants when potted or boxed. Every private establishment should have a number of cold frames, as they are preferable to greenhouses for growing many plants during the next few weeks, and the stock can be more readily hardened off and brought into good condition for planting outside.

Bedding plants at this season take up much space. Many flowering annuals are grown to use in the perennial borders and to grow for cut flowers. Our earliest Asters are now of good size in boxes in a cool frame. We usually plant these out about May 10th. Queen of Earlies and Comet are used for our first sowing, and we make successive sowings of these until the first week in July. Stocks, we find, do better grown in small pots; the possibility of breaking their roots when planting out is thus avoided. Zinnias are among the best annuals for cut flowers; while stiffer in appearance than Asters, they bloom continuously. Seedlings of these and various other annuals are now pricked off into boxes or frames. Geraniums were recently transferred to a cool frame from which Violets had been removed, and will be kept moderately close for a few days until warmer weather is assured. Coleus require strong heat, and a few sashes filled with warm stable manure and leaves provide a suitable place for these plants. Alternantheras root quickly and revel in such quarters. Carnations for summer blooming are now forming roots in three-inch pots in a cool frame. These will be planted out early in May. Winter-flowering Carnations in boxes can also be gradually hardened in a similar way. We look over the plants once a week and do any necessary stopping. Thus far there have been no signs of rust on our young stock.

Considerable space has recently been taken up with plants grown for use at Easter, and not a little judgment is necessary to bring them into flower at the right time, owing to the lateness of the season and vagaries of weather. We have this year tried a few Cape Cod grown bulbs of Lilium candidum; they are superior to the French bulbs we have usually grown, and there seems to be no reason why so many of these bulbs need be imported annually if they can be raised and sold at corresponding prices here. The sandy soil on Cape Cod and some other places is peculiarly suited to the growth of good clean bulbs of L. candidum. We plant out our forced stock after the flowers are cut, and if undisturbed for a few years and generously treated they give splendid spikes. L. Harrisii and L. longiflorum have shown a larger amount of diseased plants than ever before. Some commercial growers report that from fifty to seventy-five per cent. of their stock is diseased, thus entailing a serious loss. It seems imperative for large buyers of these bulbs to visit Bermuda during the flowering season, and see that those from whom they buy bulbs have clean stock. The disease undoubtedly comes in the dormant bulbs, and is not due to subsequent treatment. As soon as Spiræas (Astilbes) have finished blooming they are planted out in rich, rather moist, land, and make capital forcing clumps after being rested a year. The Crimson Rambler Rose has proved a decided acquisition as a flowering plant at this season. We grew a few plants from cuttings rooted late last spring, and flowered them in seven-inch pots, bending the shoots over in the form of a hoop. They all broke and flowered splendidly. This Rose is reliably hardy here, and survived outdoor treatment perfectly, while many hybrid Perpetuals were killed-back quite severely. We have some young plants now in two and a half inch pots, which will be grown along in pots for flowering next Easter.

Cannas continue to make rapid strides in popularity as is evidenced by the great numbers cultivated everywhere. But there is danger that they will become so common that popular fancy will turn to some other novelty. They are not sufficiently appreciated for winter flowering in pots. We have tried about twenty of the leading sorts this season, and the majority have been in flower since Christmas and are still loaded with spikes. Among the best varieties for pots are Queen Charlotte, Madame Crozy, F. Vaughan, Eldorado, Paul Bruant, Alphonse Bouvier, Gloire de Montet and General De Mirabel. Our stock for bedding purposes are in four-inch pots, in a Carnation-house temperature. Tuberous Begonias are capital bedding plants for partially shaded locations, where they can be kept well watered. Our tubers were recently started in boxes of light sandy loam in a frame. Water needs to be given sparingly until they are well started into growth. Fibrous-rooted Begonias are beyond question among the very best winter-flowering plants, and no greenhouse is properly furnished unless it contains some of the leading sorts. We have just potted off a lot of these plants into small pots for flowering next winter, and there is still time to root and grow on good plants if cuttings have not yet been inserted. B. Haageana erecta, B. semperflorens gigantea rosea, B. nivea (a beautiful white variety) and Paul Bruant are among the most attractive sorts we have grown, but many more are beautiful. Of newer sorts we have two of the Semperflorens type which promise to be fine, Goliath and Mastodonte. The variety Gloire de Lorraine, already several times referred to in Garden and Forest, is sure to become popular.

Pelargoniums of the regal and show sections are now flowering profusely. It is surprising that so few private places grow these plants; a bench of them in bloom presents a striking appearance. They are mostly grown in six and eight inch pots and require plenty of water, frequent doses of liquid-manure and a light fumigation every ten days for green aphis. They like a partially shaded, cool, airy house. We find them useful for decorative purposes, and we drop a little floral gum in the centre of each flower to hold the petals together.

Now, when there is a pressure of work in all departments, the compost-heap is apt to be forgotten. Our Carnation compost was prepared last fall; it will be turned over shortly to give it a thorough mixing. We usually plant our Roses out in benches early in June, and have turned over the compost-heap for these recently and added some finely ground bone. If compost-heaps have not already been prepared they should be attended to at once.

Taunton, Mass. *W. N. Craig.*

Some Cool-house Shrubs.

WITH the arrival of spring we are again reminded of the wealth of good material in hard-wooded plants adapted for cool-house culture, and which have, in this country at least, been comparatively neglected in recent years. The plant-buying public becomes more discriminating each season, however, and a greatly increased demand for the few species of hard-wooded plants now offered for sale proves that interest in them is awakening.

The few Acacias now grown, mostly A. pubescens, A. armata and A. Riceana, deserve to be more generally known, and these three species form a good beginning for a collection of these charming plants. They are as easy to manage as Azalea Indica, the chief difference in treatment being that Acacias require rather more pruning to make shapely specimens.

Azaleas can be successfully flowered in a living-room without previous preparation in a greenhouse. After blooming the plants should be repotted, if necessary, and when the weather becomes warm, for example, about May 1st, the pots should be plunged out in the garden. They should be watered thoroughly every day during dry weather, brought in before frost in the fall and stored in a light, cool room. Those I have in mind were kept in a light attic where the temperature was probably just above freezing during cold weather. They should be brought into the warmer rooms of the house as their flowers are wanted. From plants thus treated by a neighbor a bountiful crop of flowers was produced, of good size and substance.

For several seasons past it has been shown by commercial growers that species of Ericas can be grown as well in this climate as in that of Europe, and while all species may not prove equally satisfactory, there are enough of free-growing ones to add greatly to the beauty and variety of the cool greenhouse at this season. Among the easiest to manage are E. hyemalis, E. Wilmoreana, E. persoluta in its various forms, E. hybrida, E. melanthera and E. præstans. These give a succession of bloom from late autumn to early spring. Outdoor culture is the most satisfactory for these plants during summer, providing they are given plenty of water in dry weather. There is less danger from red spiders under these conditions than when the plants are kept in the greenhouse.

The Boronias and Eriostemons are also welcome additions to the cool house in spring, and do not occupy much space before reaching the blooming size. While their flowers are not very large, those of the Boronias have the added merit of being fragrant. The brown-yellow flowers of B. megastigma in par-

ticular exhale an exceedingly agreeable fragrance. Daphne Indica is an old plant that has become rare in greenhouses, where it was plentiful twenty years ago, though less meritorious plants occupy its place. The best specimens of this plant that I have seen were planted out in a Camellia house, and received precisely the same treatment as the Camellias. As a pot-plant it is not always a success, as it is easily injured by careless watering during the winter.

The Indian Rhododendrons also deserve more attention. Some of the species and varieties are seldom out of flower. The white and pink varieties are among the most beautiful, and bear large flowers, many of them fragrant.

Rondeletia gratissima (also known as Rogiera) and R. thyrsoidea both deserve a place in the cool house, since they are easy to grow and quite free-blooming. These evergreen shrubs bear terminal or axillary trusses of flowers, as the Ixoras do. After flowering they should be cut back to keep them in shape, and potted in good loam, with free drainage. Chorozema cordatum should also be included in the available list. It is easy to manage and decidedly attractive when in flower. The long and graceful shoots are laden with pea-shaped flowers of orange and red, and give a cheerful touch of color to the house. This plant also should be pruned after the blooming season, and is seldom troubled by insects unless it is grown too warm, when it is liable to be attacked by red spider.

Holmesburg, Pa. *W. H. Taplin.*

Erythronium grandiflorum and Related Species.

IN the *Botany of California*, published in 1880, Erythronium giganteum and E. grandiflorum were confused. Sereno Watson, in his *Revision of the American species of Erythronium* in 1891, corrected this mistake, but dealers and botanists had followed the older authority so long that it has been hard to overcome the error, and nearly all of the bulbs grown or sold by dealers as E. grandiflorum are really E. giganteum.

Erythronium giganteum is a strong-growing species, with the flowers one to sixteen in a raceme, and the leaves richly mottled in green and mahogany-brown. The flowers are straw-colored, with orange centre. The true E. grandiflorum has light green leaves entirely destitute of mottling, and its flower is oftener solitary. In its different forms E. grandiflorum has the widest distribution of any western species. It is found in the higher Cascades in Oregon and Washington, and in the Blue Mountains of eastern Oregon, in the Pine forests of eastern Washington, in northern Idaho and thence east to the Rockies and along that range to Colorado.

I know of three forms of this species. In the higher Cascades of Oregon and Washington there is an alpine form with light yellow flowers. It was this form and Erythronium montanum which were so beautifully represented in the recent illustration in Garden and Forest (see vol. ix., p. 504). In the Blue Mountains in eastern Oregon is found a bright yellow form, the only really yellow Erythronium. In the Pine woods of eastern Washington there is a form with pure white flowers with greenish yellow centres. In this the flowers are very large, and the narrow segments are closely recurved.

Erythronium montanum, an alpine species of the higher peaks of the Cascades, also has unmottled leaves and pure white flowers with yellow centres. In this the leaves are rounded at the base, a character which readily distinguishes it. In its high mountain home the seasons are very short, and it is wonderful how soon after the snow has melted its beautiful flowers will expand, and how much cold and what hard conditions such frail-appearing creations will endure.

In the Sierra Nevada, from the north to Tulare County, there is another species with unmottled leaves growing in high altitudes. In this the leaves are a dark purplish green, and the flowers borne in a crowded raceme. The flowers are white, with an orange centre, and are suffused with and soon turn pinkish purple. This species I have identified as Erythronium purpurascens, although Mr. Watson described the latter as having mottled leaves.

These three species then are the only western Dog's-tooth Violets with unmottled leaves, and, although varying considerably in style, stamens, etc., are very much alike in habit and growth. As garden plants they are not nearly as satisfactory at Ukiah as the mottle-leaved species, perhaps because I have not yet given them just the right position and shade. The trouble is that they flower too soon after they come through the ground and have no length of stem. I have tried giving extra shade, with some improvement, but think I will have to find a colder position for them. There is no trouble with any other species in that regard. Again, I found that Erythronium montanum, following the habit in its mountain home, does not come up till after it becomes too warm here for its proper flowering. I have the same fault to find with E. purpurascens from high altitudes, although the same species from a lower altitude is now (April 1st) in flower.

What is a fault here might prove to be a recommendation in the colder climate of the eastern states or northern Europe, and I am inclined to think that the true Erythronium grandiflorum in its various forms would do splendidly there.

Ukiah, Calif. *Carl Purdy.*

Lilium Harrisii and the Electric Light.

AT a recent meeting of the Horticulturists' Club of Cornell University, M. G. Kains presented notes of experiments with the Easter Lily. As to the effects of the electric light in its cultivation, he said that the bulbs were potted the middle of October, plunged in a solid bed late in December, and the electric light turned on January 1st. A globeless arc lamp was used. It burned from 5 P. M. until 6 A. M. for the following four months. The bed was divided into three sections. The first was exposed to the full glare of the naked light; in the second, the light passed through a large pane of glass which cut out some of the ultra violet rays, but did not impede the passage of the light; the third section was separated from the light by a black canvas curtain, which was drawn across the bed each night before the lamp was lighted. When the light was first turned on, the plants were of uniform development, but in six weeks changes appeared in the foliage, which gradually became more pronounced. The plants in the lighted sections grew very tall and spindling, had long peduncles, narrow and sallow green, very much curved leaves far apart on the stems. These effects were most apparent under the naked light. The plants in the unlighted section were more robust; had deep, glossy green leaves, were more stocky, less subject to disease, and, on the whole, more evenly developed. After the buds were formed these differences did not become more pronounced, but the buds under the naked light soon began to show a dark brown streak on the surface most exposed to the direct rays from the lamp, and this burn increased as the buds grew and expanded into blossoms. The seared petals were much more curled than is ordinarily the case with healthy blossoms, and the stripes of brown were in some cases a quarter of an inch wide on each of three petals. No such trouble was experienced with the plants in the light which had passed through the pane of glass. The earliest flowers appeared on plants in the naked light, and in this section they lasted on the average nine days. Four days later the plants in section two flowered, and lasted here nine and a half days. The plants in the unlighted section were nine days later than those in section two in coming into blossom, but the flowers, though slightly smaller, lasted eleven days and were more robust. The flowers in the lighted sections, like the plants which bore them, were spindling, but not unsightly, excepting those which were burned.

A plant with two remarkably evenly developed stems was taken from the unlighted section, and so placed that the curtain could be drawn between them, the one stem being in the unlighted section, the other among the plants behind the pane of glass in section two. A second twin-stemmed plant was also taken from the unlighted plot and placed in the naked light, but the larger of the two stems was covered each night with a tube of manilla paper to exclude the light entirely. In each case the stem in the light blossomed a day before the other stem. Some other plants of uniform development were marked, and a part of them removed to the lighted sections, the others being left in section three. The former bloomed seven days before the latter, the last blossom in the former group being three days earlier than the first blossom in the latter group. The blossoms were perfectly healthy and lasted as long as those in the unlighted section. From these experiments it is concluded that it will probably pay commercially to use electric light in cultivating Lilium Harrisii when the buds are an inch long, in order to hasten their expansion, and that the light must pass through glass to avoid burning the petals.

Cornell University. *S.*

Sternbergia Fischeriana.—This is a spring-flowering species of the well-known Winter Daffodil, and as it now appears in the border is a noticeable flower, even though it comes in Narcissus time, when yellow flowers are becoming plentiful. Sternbergia Fischeriana differs from the fall-flowering S. lutea in having much broader leaves, smaller flowers of the same rich yellow color. The peduncles are short and the flowers are borne above the leaves, which as yet are only slightly de-

veloped in height. The plant flowers freely, each bulb producing several blooms. The Sternbergias are all valuable bulbous plants in any garden and are perfectly hardy, even the leaves of S. lutea, which are in evidence all the winter, and only ripen at this season, being unaffected by the rigors. That they are not more grown is probably owing to their need of a special position in the border, which they do not always find. As S. lutea now ripens it requires a position where it will be fairly dry, and a warm place where it will be well roasted in summer. In such a position, in rather heavy soil, it has never disappointed me; and it starts in due time in the late fall and blossoms profusely, and even multiplies. The large-flowered S. macrantha, which follows this species in flower, evidently requires the same kind of location, for several clumps planted in other conditions here have as yet failed to do much in the way of flowering, though the leaves are now prominent enough.

Elizabeth, N. J. *J. N. G.*

Carnations.—These plants were never finer than they now are in the houses of William Nicholson, at Framingham, Massachusetts. Eldorado is perfection here and unique in its class. It is a fragrant picotee with yellow ground and red-edged petals. The demand for fancy striped varieties is very properly increasing every year. Della Fox has not given entire satisfaction. It was expected to supersede Daybreak, but there seems to be room for both of them, and especially for Daybreak as it is grown by Mr. Nicholson, and Mr. Tailby, of Wellesley, has Della Fox at its best, and this is remarkably good. Hector, where it succeeds, is a superb variety, but florists about Boston are looking for a better scarlet than Portia. A very high opinion is given of Tailby's new scarlet. As seen with him it does not appear to have a fault. In strength of stem and size and shape of bloom it is Daybreak in every particular except color, while it is better in constitution and fully as free. Jahn's scarlet has first-rate points, but it fades quickly, and the same may be said of Nicholson's Camp Fire, which has proved a splendid summer bloomer.

Calla Elliottiana.—Mr. Watson's reference to the yellow Callas reminds me that I saw just one hundred seedlings a few days ago at Mr. Tailby's, all from one head of seed; 104 seeds germinated and four plants died. From the three original plants raised two years ago Mr. Tailby has raised twenty by offsets and division. Dividing is hazardous, and one fine plant was lost through this method. That they need some moisture during the winter and tolerable warmth is the experience on this side. Hybridizing with our common Arums has been tried, and also with the Little Gem Calla, but evidently without advantage. What seems the most likely and possible cross will be tried this season with Richardia alba maculata, a species in appearance very similar to C. Elliottiana.

Wellesley, Mass *T. D. Hatfield.*

Correspondence.

Notes from Cornell University.

To the Editor of Garden and Forest:

Sir,—A number of interesting things are now going forward in the Horticultural Department at Cornell University. Perhaps the most unique venture is the plan to grow this year all the kinds of annual flowers. These plants have been given very little systematic study in this country, and their botanical classification and direction of evolution are very little understood. An excellent piece of land has been set aside for the test, and all the tender species have already been sown in flats in the forcing-houses. The greater part of the kinds, however, will be sown directly in the field. J. M. Thorburn & Co. have supplied over 800 kinds of flowers to this test, and it is the desire of Professor Bailey to receive seeds of any varieties of annual flowers which seedsmen or others may wish to have tested.

The Dahlia test is to be continued this year. An excellent plot of ground is available for this purpose. Seeds and tubers of a number of the wild species have been received from Mexico, and these are already growing under glass. It is not expected that this Dahlia test is to comprise all the varieties now on the market, but it is probable that over 500 kinds will be grown. The American Dahlia Society will send a committee to inspect the plantation this year.

Just at present a fine collection of Geraniums is in bloom in one of the houses. About 430 varieties are in flower, distributed among the various groups, as Bedding Geraniums, Ivy-leaved Geraniums, Show and Tricolor Pelargoniums, Rose Geraniums and the like. Professor Bailey is taking great interest in Pelargoniums just now because the group is a most fertile one in which to study many problems connected with the evolution of plants. He is in correspondence with persons at the Cape of Good Hope, whence he hopes to secure some of the wild types, and he will look up the subject abroad during the present summer.

A very large collection of Ixias is just now passing out of bloom. Over fifty varieties of Mignonette are now in full glory, and a number of experiments are going forward respecting the influence of certain conditions upon fragrance.

The second crop of Strawberries is now passing. The first crop was off about a month ago. The larger part of a house, twenty by thirty feet, has been devoted to the Strawberry, and the most satisfactory results have been secured. The first crop averaged six to eight perfect berries to the pot, and the first quart sold (early in March) for $2.00. So far, the Beder Wood has given the best results, although the color is too light for an attractive berry. Van Deman is now in crop, but, although a perfect flower, it seems to need extra care in pollination. The handsomest berry in the house is the Hunn, but its lateness debars it from winter cultivation.

An extra effort is being made to determine the causes of unsatisfactory results in the growing of Mushrooms. In order to study the question under the best conditions an ideal house was built last summer, with stone sides and iron roof, with an inside space of about thirteen by eighty-two feet. Something like a dozen methods of growing Mushrooms have been tried during the winter. Some of them have resulted in entire failure, and others have given excellent results. One of the curious things in connection with the experiment is the fact that the wettest beds—even those which are almost soaking wet—have, so far, given the best results, although this seems to be contrary to general experience.

Ithaca, N. Y. *A. B. C.*

An Orchid Scale, Aspidiotus biformis.

To the Editor of Garden and Forest:

Sir,—The scale which I described as Aspidiotus biformis was discovered on June 9th, 1892, on a plant of Cattleya Bowringiana at Hope Gardens, Jamaica. On July 7th of the same year I found it again on an Orchid at the Kingston (Jamaica) Flower Show. In December, 1892, Dr. Henderson found a variety of the same scale on Odontoglossum grande at Kingston, Jamaica. In the meanwhile Mr. Hart had detected it in the Royal Botanic Gardens, Trinidad, on Oncidium sprucei; later he found it also on Epidendrum. Occurring thus on several genera of cultivated Orchids, I had expected that the scale would before long be brought to the United States, though no specimens had yet been seen except from the West Indies. This expectation has now been realized, but, fortunately, the scale has been prevented from landing by Mr. Craw, who found it on a vessel from Central America arriving with Orchids at San Francisco. The specimens have been transmitted to me, but the exact locality where the Orchids were obtained is unknown, nor do I know the species of Orchid.

The female scale is small and round, nearly flat, of a reddish brown color, quite dark; the male scales are very small and inconspicuous, elongate in form. By the shape of the male scales, especially, the insect is readily distinguished from Aspidiotus ficus, which it somewhat resembles. The microscopical characters are very distinct; the lobes are very distinct, and in the Central American specimens I find four groups of ventral glands, rather scattered, four or five glands in a group. The margin cephalad of the third lobe presents three low minutely crenate elevations, after which comes a conspicuous notch, and beyond this are more minute crenations.

It is very probable, of course, that this scale will gain access to some of our hot-houses, where it may become troublesome on choice Orchids.

Mesilla, N. M. *T. D. A. Cockerell.*

Plants at Wellesley.

To the Editor of Garden and Forest:

Sir,—The greenhouses on the place of H. H. Hunnewell, at Wellesley, Massachusetts, are just now especially interesting for plants which are intended for summer decoration. Pelargoniums, Show Geraniums, Fuchsias, Roses, Spiræas, Astilbes, Indian Azaleas and many other plants in pots are pushing vigorously forward.

Cytisus Andreanus in bloom is especially beautiful; the large yellow flowers, with reddish brown standards, are very showy. It must be a splendid plant for shrubbery borders where it is hardy, as, for example, in our southern states or in California, where it ought to flourish. A bush of the European

Gorse, Ulex Europæus, an allied plant, is not to be despised. It at least reminds Old World gardeners of home. A few Imantophyllums remain in bloom. One of the best is from a set of seedlings sent here for trial by Messrs. Veitch, of London. It is much superior in size and color to the type. A well-flowered bush of Franciscea confertifolia, with salver-shaped flowers of light and dark blue, is very attractive. It is an interesting specimen, and one of the good old plants of which, in this age of commercial rotation, we see fewer every year. Gloneria (Psychotria) jasminoides is another of these. It is a bush of slow growth, and this specimen is about six feet high and probably twenty years old. It belongs to the Rubiaceæ, and its opposite leaves and umbellate arrangement of narrow-tubed four-limbed corollas remind one of the more common Ixoras which belong to the same order. A grand specimen of Lomaria gibba has just furnished itself with a new set of fronds—the second set this winter. It has a clear stem three feet long and a spread of six feet—a specimen such as one seldom sees. Here, too, is an extensive collection of hybrid Hippeastrums, new and old, and some of them are carrying gorgeous flowers. H. vittatum, though one of the oldest, is among the best. Olympia has blooms of orange-red seven inches in diameter, and H. Mastersi, though small, is free-flowering, with early deep red blooms. I have a batch of seedlings from a cross between H. Johnsoni and H. Mastersi, and although H. Johnsoni is the seed parent the majority of the seedlings, as far as they have flowered, show a decided leaning toward the pollen parent. As H. Mastersi is earlier than H. Johnsoni, does this account for the preponderance of the former among the seedlings which first show flower?

Wellesley, Mass. *T. D. Hatfield.*

Notes from Germantown.

To the Editor of Garden and Forest:

Sir,—Our early-flowering shrubs have done uncommonly well this spring. Such plants as Jasminum nudiflorum and Lonicera fragrantissima were very full of flowers, and none of the buds were injured by cold. Chimonanthus fragrans flowered in a desultory way with us, beginning with a few blossoms in February, then came others in March, and I notice a few opening to-day, as late as the 15th of April. I am told that the flowers of Chimonanthus expand about Mobile in January, and that it bears seed there freely. Next to the three shrubs mentioned, Daphne Mezereum flowered, a much-neglected plant and hardy several degrees north of this latitude; then followed Cornus mas, an excellent shrub because it continues in flower a long time, and as I write, on the 15th of April, the flowers are still opening rapidly. Besides this, it is beautiful in fruit and foliage. Prunus Davidiana followed the Cornus closely; Forsythia suspensa is now in full display a little in advance of the variety known as viridissima, and with larger and lighter-colored flowers. Our native Spice-wood is in full bloom; Magnolia stellata is in its prime, and the flowers of M. Kobus are beginning to open a little in advance of those of M. conspicua, which is itself a day ahead of M. Soulangeana.

I have rarely seen our Swamp Maples so beautiful as they are now. Some of them are a perfect mass of brilliant red flowers. There is a great difference in the color of the flowers on individual trees, and this point ought to be considered in propagating varieties. The flowers are dropping from the Elms and Soft Maples, and as no frosts have occurred since they opened, we shall undoubtedly have an abundance of seed.

Germantown, Pa. *Joseph Meehan.*

Recent Publications.

Diseases of Plants Induced by Cryptogamic Parasites. By Karl Freiherr von Tubeuf, translated by William G. Smith. Pp. xv., 598, 8vo. with 330 figures. Longmans, Green & Co., London and New York.

This treatise is one of the best general works on fungi which cause diseases of plants which have yet been published. The original German edition appeared only in 1895, and it is unusual for an English translation of so large a book to be prepared in so short a time. This is, perhaps, due to the fact that Dr. Smith, the translator, was at one time a pupil of Dr. von Tubeuf, and was on that account the better able to present his views to the English-speaking public. The translation follows the original closely in most respects, but in some cases, as in the accounts of the genera Exoascus and Gymnosporangium, the subject has been revised and extended by the author so as to embody the results of recent investigations. In form the treatise is encyclopædic, a general enumeration and description of all the principal parasitic fungi which are of interest to the vegetable pathologist being prefaced by short chapters on the nature of parasitism, the effects of fungi on their hosts, their relation to the substratum, and similar topics on which the non-professional reader needs information before proceeding to the consideration of special fungi. There is also a short account of preventive and combative measures, and two chapters on symbiosis. The author has shown good judgment in his management of these topics, and, although brief, is clear, and he has avoided entering upon lengthy discussions of questions on which authorities differ.

By far the larger part of the book is devoted to descriptions of different species of parasitic fungi, including not only European fungi, but many species from North America and other parts of the world. The author has summarized the very large number of papers relating to fungi which cause diseases of plants which have appeared in recent years, and few books on a subject in which new facts are brought out monthly, and almost daily, have the appearance of being so well up to date as the present work. The fungi are arranged by their orders, beginning with the lower, and under each order are given the more important genera and species pathologically considered. Then follow chapters on pathogenic slime-fungi, bacteria and algæ. The pathogenic bacteria are very summarily treated, but the plan of the author evidently did not require a full treatment of these forms, which, at the present day, are usually relegated to special treatises. At the end are a very convenient index of parasites and an index of host-plants. We know no book on the subject which presents so attractive an appearance. The text is unusually clear and well arranged. The numerous figures are, in nearly all cases, well executed. Those taken from other works are well selected and do not have the time-worn look often found in treatises on this subject, and there are also many original and characteristic habit-pictures. The figures in the translation, however, are not so well executed as those in the German edition. In short, the book is one which should be in the working library of all students of economic fungi.

As a supplement to the manual entitled *Vegetables under Glass*, Mr. Henry Dreer has just issued a similar work on *Vegetables Grown in the Open Air*. The plants are grouped according to their botanical affinities, an arrangement which has many advantages, but which we have never before seen followed in a manual of this sort. This study of plants which are botanically related affords an opportunity to give certain descriptions of the general characteristics and cultural requirements of the entire group, and the specific differences can be explained in connection with the general resemblance which they bear to each other. The subjects of drainage and fertilizing, irrigation, spraying and storing the crops are treated in a practical way, and the cultural details contain abundant quotations from practical growers upon specific points. Altogether, it is a good little book, and the same may be said of *Grasses and Clovers*, another one of this series which is generally known as Dreer's Library. This is a little handbook on forage crops, with a chapter on lawn-making and lawn management. We have been trampling grasses under our feet all our lives, and yet perhaps there are few plants about which we really know so little. This little treatise will be found useful to any one who is beginning the study of this interesting family. But besides the Grasses, leguminous crops are made the subject of a discriminating essay, and farmers everywhere are urged to experiment with the Cow Peas, the Clovers, Vetches, Tares, Beans and other plants of this family on account of their special power of transferring the free nitrogen of the air to the soil and thereby enriching it with the most expensive element of plant-food. These manuals cost only twenty-five cents each.

Notes.

Magnolia stellata was in full flower in the vicinity of this city on the 15th of April. The fine specimen which we figured on page 195 of vol. ix. was a mound of snowy bloom more than twelve feet in diameter.

Two little girls near Croydon, England, recently died of acute inflammation of the stomach brought on by eating young growths of the common Privet. Children should be cautioned against eating the leaves or fruit of any plant with which they are not familiar.

Pots of fruiting Strawberry-plants were an attractive Easter specialty in a fruiterer's window on Broadway last week. The foliage was fresh and luxuriant, with three or four large highly colored ripe berries and a few immature ones. The plants sold for $1.50 to $2.50 each.

The white form of Chionodoxa Luciliæ seems to grow as strongly as the type, and makes a grateful contrast with it. The white form of C. gigantea is rare, but it is a sturdy and desirable plant, and we may hope that within a reasonable time white Chionodoxas of all the species will be comparatively abundant.

Several large growers of Lilies for the Easter market make complaint in the *American Florist* that the bulbs of Lilium Harrisii which are grown in Bermuda are proving generally diseased. They all agree that these bulbs could be satisfactorily grown in our southern states, the only trouble being that Americans are disinclined to wait for profits. It would require two years at least before any crop could be marketed.

The first tree with conspicuous blossoms to flower this year in the Arnold Arboretum was the north China Peach, Prunus Davidiana, which was fully out ten days ago and has been extraordinarily beautiful. This tree is perfectly hardy, but the flowers are often killed by frost after the buds begin to swell, and during the ten or twelve years that it has inhabited the Arboretum it has only once or twice before flowered as profusely as it has this spring, and although producing more or less flowers every season it has not borne fruit yet in the Arboretum. P. Davidiana ought to be better known as an ornamental tree, as it flowers before any of its kind, and the pale pink petals, although not as large as those of some forms of the cultivated Peach, are exceedingly attractive.

Maple wood has a distinct and positive value for flooring which no other hardwood which is workable possesses. Its hardness and smoothness give it power to endure the severest wear; it has a light and attractive color, and it can be cleaned as easily as Maple. It has hitherto been abundant enough to meet the growing demand in every part of the continent and the requirements of the large export trade. Nevertheless, since only a part of the tree is utilized, the waste of the lumber is great, and the best hard maple, which is found in the lower Michigan peninsula and in Wisconsin, is disappearing more rapidly than even the Pine did, because, as a rule, good Maple land is good farming land. The time seems to be coming when the supply will be depleted, and the *Northwestern Lumberman* is, no doubt, right when it complains of the reckless competition under which this valuable product is sacrificed.

Different species of Swainsonia, particularly S. Greyana and S. galegifolia, which is largely grown for cut flowers in this country now, are plants which are greatly dreaded by the stock growers in Australia. Chemical analysis does not show any toxic principle in the plants, and yet when sheep and other animals eat them they acquire a habit for them and will eat nothing else, their brains seem to become affected, they never fatten, and finally die. Sheep addicted to this habit are known as "Indigo eaters," and they separate from the flocks and wander about listlessly. A case is recorded where horses hobbled for the night at a place where Swainsonia was growing were difficult to catch the following morning, their eyes were staring out of their heads, and they pranced about against trees and stumps. Two out of nine died the second day after, and five others had to be left in the camp, for when driven they would suddenly stop, turn round and round for a time, then fall down, rise again and repeat the performance. No experiments as yet give any reason for the complicated effects which this forage has on stock, but there certainly is much testimony to the fact that it causes a sort of madness which induces creatures who feed upon it to attempt to climb trees or commit other eccentricities. Baron Mueller believed that Swainsonia possesses the deleterious properties attributed to it, and he publishes this view in the Transactions of the Royal Society of Victoria.

Fresh figs are hardly known in northern markets because the fruit is so perishable. They ripen when the weather is hottest and can be handled only by experienced persons. It is costly work, too, to prepare the fruit for distant marketing. The trees need to be picked over carefully every day, and this involves much labor; rainy weather occasions loss by packing, and the acrid juice of immature figs eats into the fingers of the pickers and packers. It is necessary to pick them while still firm, which is a misfortune, for although they become quite edible when soft they lack the fine quality of tree-ripened fruit. In their best condition they will hardly keep thirty-six hours at ordinary temperatures, but, of course, they can be kept much longer in a cold temperature, so that with rapid refrigerator transportation the shipment of figs from the south might become a business of importance. Next to fresh figs canned figs are the best, and there is no reason, except for the larger quantity of sugar required, why figs should not be grown and canned as cheaply as peaches. The figs are sometimes peeled before canning, and this is supposed to increase the delicacy of their flavor. Usually, however, they are cooked unpeeled and with the stems on as they come from the tree, as they hold their shape better when treated in this way. Canned figs, however, are not common in our markets and their price is high. And yet the factories at Biloxi, Mississippi, and New Orleans at one time put large quantities of canned figs on the market, for the demand was very active up to the panic of 1893, and the canners paid as high as four cents a pound for the fresh fruit and could not get enough to fill orders. Each factory has its own method of canning, and the process usually takes two days. In the finished product the fig holds its shape perfectly but becomes partially transparent, and as the final syrup is clear and free from sediment it is very attractive. All this information is found in a bulletin on Fig Culture just issued by the Division of Pomology of the United States Department of Agriculture, where many interesting facts about the cultivation and curing of figs in California and in the Gulf states are set forth.

The trade in plants for Easter was a very active one this year, and immense quantities of many kinds were sold for home and church decoration. Lilies and Azaleas were, as usual, the favorites, and most abundant, though in the displays made by florists Lilies were not so prominently shown as many other plants which are less popular, and therefore need to be brought to notice. Hydrangeas sold slowly, and one of the most extensive dealers declared that half the Easter stock of these plants remained on the hands of the growers, and the other half which had been sold to the retailers was left on their hands. These plants require more water than they generally receive in households, and so last but a short time and have lost favor. Japan Maples, with bright variegated foliage and trimmed back into small plants, were observed in one collection, and other plants seen in one or other of the best stores were Anthuriums, pink Bouvardias, Kalmias and Otaheite Oranges. The delicately flowered Spiræa Thunbergii was noted, but hardy shrubs forced into flower were comparatively rare. Occasional neat little plants of the Australian Boronia heterophylla were distinct and bright, with small bell-like carmine flowers. Marguerites were plentiful, as were Ericas, with Lilacs and Cytisus in smaller supply, and but few Cinerarias. There were the usual spring bulbous-flowering plants and attractive pots of Violets, with the cheaper Vincas in flower, and in some of the most costly collections were pots of stockily grown General Grant Geraniums, which, on account of the approaching memorial celebration of the dedication of the Grant monument, were in special demand. Candytuft, Stocks and other herbaceous plants were not unusual, and pots of floriferous Begonias were delicate and pleasing among more bold and conspicuous offerings. One or two of the windows exhibited extravagant arrangements of plants in crêpe paper and broad ribbons, and of large boxes of fanciful colors, and in these same stores some of the plants were veiled in fine silk net. But this attempt at adornment was exceptional, and most of the plants in pots were shown on their own merits, and without any artificial disfigurement. There were some simple and pleasing arrangements of plants in round and oblong baskets, the latter of plainly woven fibre, generally green. Lily-of-the-valley, edged with Violets, and white Hyacinths and Violets, bordered with Tradescantia, were two of these simple and natural plantings. A larger basket held tall plants of Lilies, Heather and a few heads of Hyacinths, well grouped and singularly attractive. In another basket nearly a dozen dense and airy heads of Spiræa compacta rose in the centre above two colors of Heather and a cluster of several shades of pink Hyacinths, while well-grown Ferns gave a flourishing and established air to the whole.